DEL MONTE CORPORATION OAHU PLANTATION SUPERFUND SITE

U.S. Environmental Protection Agency • Region 9 • San Francisco, CA • March 2003

U.S. EPA PROPOSES FINAL REMEDY FOR SITE

This fact sheet announces the United States Environmental Protection Agency's (EPA) preferred cleanup actions to address contamination at the Del Monte Corporation Oahu Plantation Superfund Site, in Kunia, Hawaii. EPA is seeking your comments on this proposal.

To assist the public in providing its comments, this fact sheet provides specific information about the alternative cleanup methods EPA considered. If you are interested in providing comments, please see Page 8 for more information. EPA's proposed action is preliminary and a final decision will be made after all comments are considered.

A 30-day public comment period will be held from March 19, 2003 to April 18, 2003. In addition, a public meeting will be held on April 2, 2003, at the Wahiawa Middle School Library from 7:00-9:00pm, to accept verbal and/or written comments.

EPA will acknowledge and respond to all comments to this Proposed Plan in a document called a Responsiveness Summary. To help the public understand the basis of EPA's final decision, a copy of this document will be available in the Del Monte Site Information Repository at the Wahiawa Public Library.

PUBLIC MEETING

April 2, 2003
7:00 p.m. - 9:00 p.m.
Wahiawa Middle School Library
275 Rose Street
Wahiawa, Hawaii

PUBLIC COMMENT PERIOD

March 19, 2003 to April 18, 2003

EPA's proposed plan is part of its public participation responsibilities under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

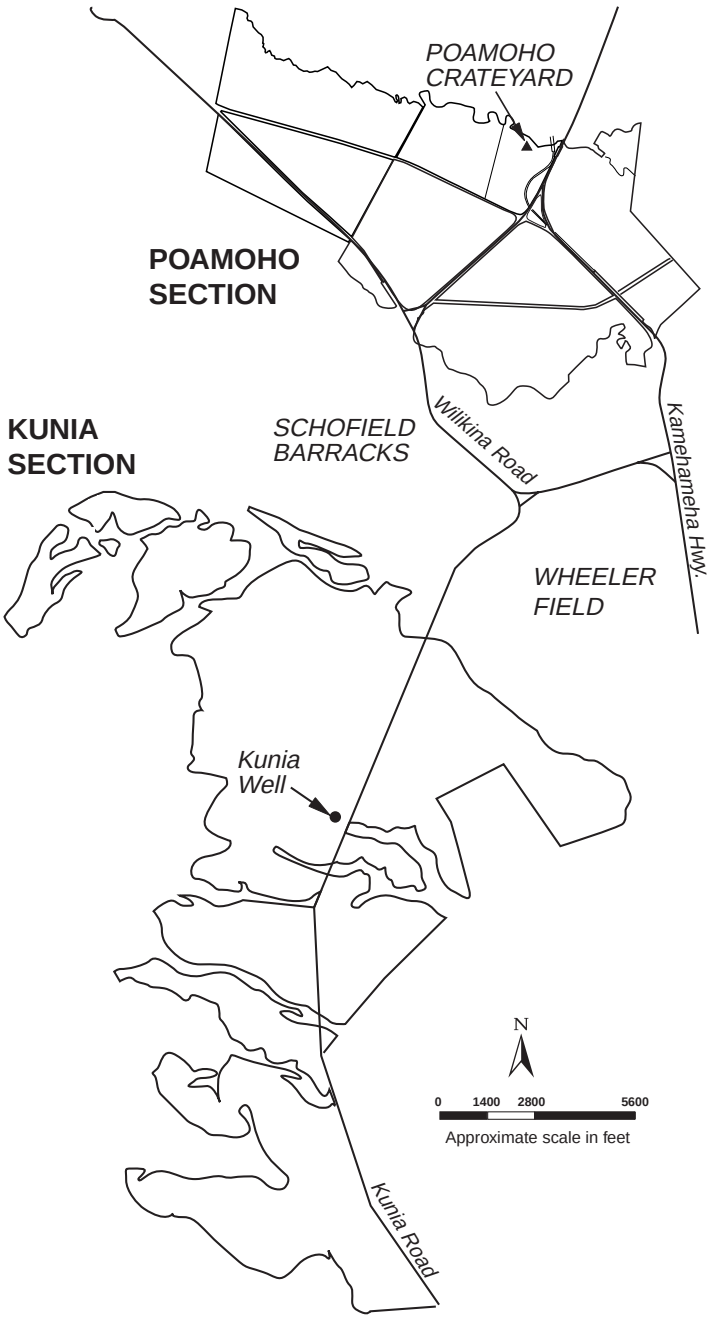

Figure 1: Del Monte Superfund Site features

Site History

The Del Monte Site is part of a 6,000-acre pineapple plantation operated by Del Monte Fresh Produce (Hawaii), Inc. The Del Monte site has been used for growing pineapples since the early 1940s. During that time, a number of chemicals were applied to the soil to kill nematodes (worms that attack pineapple roots).

On April 7, 1977, a 495 gallon pesticide spill occurred near the Kunia Camp Well in the Kunia Village Area. The well was immediately tested and no contamination was found. In 1980, tests by the State of Hawaii Departments of Health and Agriculture and the Pineapple Growers Association of Hawaii found pesticides in the Kunia Camp Well. Del Monte immediately disconnected the Kunia well from the Kunia Village drinking water system and then pumped the well in an attempt to recover the spilled pesticides. The well was pumped periodically from 1980 to 1994 and the water was used to irrigate a non-crop field. EPA asked Del Monte to cease these activities due to concerns about reuse of untreated groundwater.

Following the discovery of contamination in the Kunia Well, Del Monte in cooperation with the Hawaii Departments of Agriculture and Health, conducted soil and groundwater investigations to determine the extent of contamination in the spill area and adjacent areas where pesticides had been stored and mixed. Based on these investigations, 2,000 tons of contaminated soil were removed from the EDB spill area in 1981, and 16,000 tons of contaminated soil were removed from the former pesticide mixing and storage areas in 1983. The excavated soil was spread on a nearby field. In addition, three groundwater extraction wells were installed into the perched aquifer and were pumped periodically from 1980 to 1994.

On December 16, 1994, the site was added to EPA's National Priorities List (NPL) which allowed U.S. EPA to use federal Superfund resources to oversee a cleanup of the site.

Under EPA's direction, between 1997 and 1998, Del Monte conducted an investigation to determine the nature and extent of contamination. From 2000 to 2001, Del Monte conducted a supplemental investigation in the Kunia Village Area of the site. The results of the investigations are discussed below, and provide the basis for this proposed plan. For more detailed information on the results, please see the Remedial Investigation Report dated November 1998 and the Remedial Investigation Report Addendum dated April 5, 2002 located in the Wahiawa Public Library.

At the Del Monte Site, there is currently no exposure to contamination. The concern is that, in the future, people could be exposed to contaminants through the use of well water that has been or could become contaminated. To prevent this, EPA intends to clean up both the groundwater at the depth where wells operate, and the shallow groundwater and surrounding soil which contributes contaminants to the deeper zone.

EPA's preferred cleanup remedy is divided into two parts: 1) the shallow groundwater (perched aquifer) and contaminated soil in the Kunia Village Area from approximately 20 feet below the ground surface to 100 feet below ground surface, and 2) the deep groundwater (basal aquifer). The proposed remedy will address contamination through the following actions:

Perched Aquifer

- Pumping contaminated water from the perched aquifer for treatment
- Treating the contaminated groundwater using plants (phytoremediation)
- Placing a vegetated soil covering (cap) over the contaminated soil area to reduce the amount of rainwater that moves through the soil and carries contaminants down to the basal aquifer
- Removing soil contaminants using a soil vapor extraction system (SVE)
- Restricting land use to prevent damage to the cap

Basal Aquifer

- Pumping and treating contaminated groundwater in a phased manner, starting at the Kunia Well (the source area)
- Installing monitoring wells to 1) characterize the extent of contaminated groundwater, 2) determine the effectiveness of pumping groundwater, and 3) evaluate whether natural processes (referred to as natural attenuation) are effective at reducing contaminant concentrations in the remainder of the aquifer to drinking water standards
- If there is no evidence of natural breakdown, add pumping wells to ensure the entire plume is being captured and treated
- Treating the contaminated groundwater to drinking water standards using air stripping and carbon filtration

- Using treated groundwater for irrigation
- Restricting land use to prevent activities that may interfere with groundwater extraction and monitoring wells.

Groundwater and Soil Sampling Results

The site investigation found that in the Kunia Village Area, groundwater occurs within two distinct zones, the perched (shallow) groundwater zone and the basal (deep) groundwater zone. The perched zone, which extends to depths of about 100 feet below ground surface (bgs), does not yield enough water to be a potential water source. However, contamination in the perched zone is of concern because water from the perched zone infiltrates down to the basal aquifer. Basal groundwater, which is a source of drinking and irrigation water, begins at about 850 feet bgs.

Contamination was found in both groundwater zones at levels that exceed drinking water standards, known as Maximum Contaminant Levels or MCLs. MCLs are expressed in parts per billion (ppb) which is one part of a chemical in one billion parts of groundwater. Chemical concentrations in the perched zone are much higher than chemical concentrations in the basal aquifer (up to 10,000 ppb vs. up to 1 ppb). The main chemicals of concern in both perched and basal groundwater include the pesticides ethylene dibromide (EDB), 1,2-dibromo-3-chloropropane (DBCP), and 1,2,3-trichloropropane (TCP). Perched groundwater also contains the pesticide 1,2-dichloropropane (DCP).

A groundwater model was used to estimate the distance contamination could have traveled away from the Kunia Village Area in deep groundwater at concentrations above the safe drinking water standards. The maximum distance estimated is approximately 4,500 feet downgradient (or south of the Kunia well), which remains within the boundaries of the Del Monte plantation. The extent of contamination in the basal aquifer will be verified with groundwater monitoring wells which will be installed during design of the remedy.

The site investigation also included collecting soil samples in the Kunia Village Area as well as areas that were previously used for chemical storage and empty drum disposal (referred to as "Other Potential Source Areas"). In the Kunia Village Area, soil below 25 feet contains contaminants that could infiltrate and further contaminate the basal aquifer. No chemicals were detected in soil samples collected in The Other Potential Source Areas at levels that require clean up.

As part of their investigation and feasibility study, Del Monte conducted a series of tests to evaluate whether plants could be used to treat contaminated water. While the application of plants to treat contaminants was a proven technology, it was unknown whether the pesticides could be treated using available plants. The studies concluded that the cleanup method was effective and viable for treating the low volumes of water extracted from the perched zone but not practical for treating the large volumes of water extracted from the basal aquifer.

EPA Looked at the Health Risks

Before it proposes a remedy, EPA evaluates the current and future risks to human health and the environment. To do this, EPA must determine the kinds of contaminants that are present, their concentration and where they are located. Then EPA must determine how people or the environment can be exposed to the contaminants and if so, determine whether exposure can cause unacceptable health risks.

EPA looked at two general scenarios where people might be exposed to the contaminants at the Del Monte Site: workers exposed to contaminated water while irrigating fields and residents who depend on contaminated water for drinking, cooking, and bathing. Exposure to contaminated soil was not evaluated since the contamination is at 25 feet below ground surface, so the greatest potential for exposure is if the contaminants move into the groundwater. Although EPA evaluated the risks associated with exposure to contaminated groundwater, there is no evidence that there is any such exposure at the Del Monte site.

If exposure is found to pose unacceptable health risks, cleanup goals are set at levels where the estimated health risks are considered by EPA to be acceptable. For contaminants which cause cancer, an acceptable health risk is considered to be one additional cancer case to one hundred additional cancer cases caused by site contaminants in a population of one million people exposed over a lifetime. For contaminants which cause health effects other than or in addition to cancer, EPA's goal is to ensure that the level of exposure to contaminants in the environment do not exceed the level of exposure which might cause a health effect.

EPA looked at the potential health risk for the following situations:

1) Future risk to Kunia Village residents using Kunia Well water, *if no cleanup actions were taken*
2) Future risk to Kunia Section irrigation workers using Kunia Well water, *if no cleanup actions were taken*
3) Future risk to downgradient residents located up to 1.5 miles from the source area and using well water from the basal aquifer, *if no cleanup actions were taken*
4) Future risk to downgradient residents located at 3 miles and 4.5 miles from the source area and using well water from the basal aquifer, *if no cleanup actions were taken*

Table 1, below, lists the scenarios and the results of the risk evaluation.

EPA Considered the Options

When the EPA develops a cleanup remedy, it must look at multiple ways to accomplish the cleanup. These are called cleanup options or alternatives. EPA looked at possible cleanup options for both the perched groundwater and soil in the Kunia Village Area and the basal groundwater.

The cleanup options are developed to address the human health and environmental risks identified at the Del Monte site. As previously described, the most significant human health risk at the Del Monte site is consumption or use of contaminated water from the basal aquifer. Therefore, the cleanup options considered for the perched aquifer are intended to prevent contamination in that zone from further contaminating the basal aquifer. The cleanup options considered for the basal aquifer are intended to cleanup the contaminated groundwater so that the water can be used as a drinking water source.

Basal groundwater contamination in the vicinity of the Kunia Well is referred to as "the source area." Contaminated groundwater that has migrated away from the source area is referred to as "the plume." The objective of the basal aquifer cleanup options (except No Action) is to clean up both the source area and the plume.

The cleanup alternatives considered for the perched aquifer are:

1) No Action
2) Extracting and Treating Contaminated Groundwater and Capping the Contaminated Soil
3) Extracting and Treating Contaminated Groundwater, Capping Contaminated Soil, and Implementing Soil Vapor Extraction (SVE)

Situation	Cancer Risk	Non-Cancer Risk	Further Action Required?
Health risk for future Kunia Village residential exposure to untreated Kunia Well water	nine additional cancers in 10,000	exceeds acceptable levels	YES
Health risk for future Kunia Section irrigation workers	six additional cancers in one million	does not exceed acceptable levels	NO
Health risk for future residents living up to 1.5 miles downgradient	two additional cancers in 10,000	exceeds acceptable levels	YES
Health risk for future residents living 3 miles and 4.5 miles downgradient	nine additional cancers in a million	does not exceed acceptable levels	NO

Based on the potential *future* cancer risk to Kunia Village residents and downgradient residents within 1.5 miles of the source area, it is appropriate for EPA to conduct a cleanup action.

Table 1: Risk scenarios

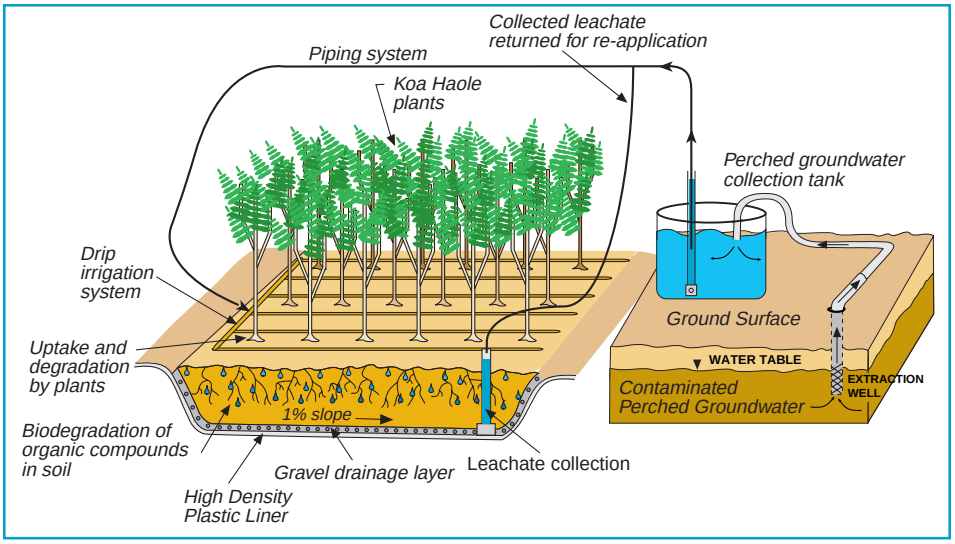

Figure 2: A Schematic of Phytoremediation

The cleanup alternatives considered for the basal aquifer are:

1) No Action
2) Extracting and Treating Contaminated Groundwater with an Option for Monitored Natural Attenuation in the Downgradient Plume
3) Groundwater Extraction and Treatment of both the Basal Aquifer Source and the Downgradient Plume

Description of Cleanup Alternatives

Perched Aquifer Alternative 1: No Action

The No Action alternative is used to compare against other alternatives under consideration. The No Action alternative means that no further work will be performed to address the site's contaminants. The No Action alternative can only be chosen if the concentration of contaminants is below the level where U.S. EPA would take further action. This means that the site must be safe for human use.

There is no cost associated with the No Action alternative.

Estimated clean-up time is greater than 30 years.

Perched Aquifer Alternative 2: Groundwater Extraction and Treatment with Capping

In this alternative, the contaminated groundwater in the perched aquifer would be pumped out and treated with plants, also referred to as phytoremediation (see Figure 2). Studies at the Del Monte site have shown that plants can effectively treat the quantity of water that will be pumped from the perched aquifer.

The area where contaminants originated would be covered with a soil barrier or Cap. The Cap would reduce the amount of rainwater that moves through the soil and carries the contaminants down to the basal aquifer.

The cost for Perched Aquifer Alternative 2 is $2.1 million.

Estimated clean-up time is greater than 30 years.

Perched Aquifer Alternative 3: Groundwater Extraction with Capping and Soil Vapor Extraction

This alternative includes all the elements of Alternative 2 and adds a soil vapor extraction system (SVE).

Although soil appears to be solid, there are many air gaps between the individual soil particles. Contaminants in vapor form (volatile chemicals) can be present in the air spaces between soil particles. An SVE system uses special wells to create an underground vacuum which pulls contaminants from the ground, which reduces the threat that they will move down to the basal aquifer. The air drawn from

What is Phytoremediation?

Phytoremediation uses plants to clean groundwater. The Del Monte phytoremediation treatment system consists of two 150 foot long, 50 foot wide, 4 feet deep lined pits which are planted with Koa Haole. Extracted groundwater is delivered to the root zone of the plants via subsurface drip irrigation. Any water that is not used by the plants is collected and recycled back into the treatment unit. Agricultural mulch film covers the soil to minimize the release of contaminants in vapor form to the air (volatilization). Data collected shows that contaminants are effectively degraded in the treatment system. There is no evidence that contaminants are volatilizing from the treatment unit in measurable quantities, accumulating in the soil, or accumulating in the plant tissue.

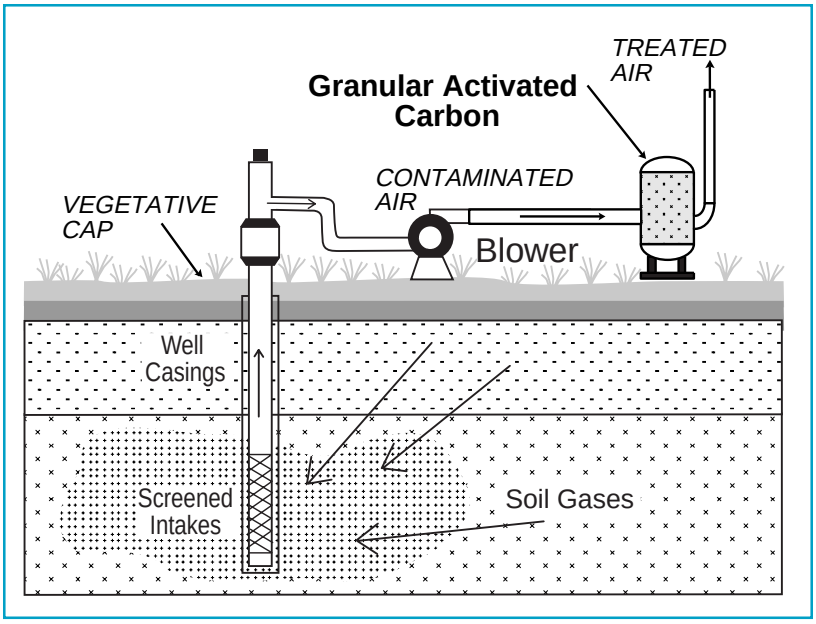

Figure 3: A Schematic of Soil Vapor Extraction

the soil is then passed through a carbon filter which captures the contaminants before releasing the air.

The cost for Perched Aquifer Alternative 3 is $3.0 million.

Estimated clean-up time is 8 years.

Basal Aquifer Alternative 1: No Action

As stated before, the No Action alternative serves as a baseline to compare against other alternatives under consideration. The No Action alternative means that no further work will be performed to address the site's contaminants. The No Action alternative can only be chosen if the concentration of contaminants is below the level where U.S. EPA would take further action. This means that it must be safe for human use.

There is no cost associated with the No Action alternative.

Estimated clean-up time is greater than 30 years.

Basal Aquifer Alternative 2: Phased Groundwater Extraction and Treatment with Contingent Monitored Natural Attenuation.

This remedy involves several steps or phases. The first phase includes pumping groundwater from the Kunia Village Area (the source area) to prevent chemicals that reach the basal aquifer from migrating outside of the source area. Extracted groundwater will be treated using air stripping and carbon adsorption to remove contaminants.

Air stripping is a process where air and extracted groundwater flow in opposite directions in a tower. The air extracts volatile chemicals from the water (see Figure 3). This air (off-gas) is then discharged into the atmosphere. Under state air quality regulations, sources that discharge less than 0.1 of a ton per year of chemicals to the air are not required to treat the emissions. Based on the concentration of chemicals in basal groundwater, it is expected that once this water is treated using air stripping, the off-gas will be much less than 0.1 of a ton per year.

In addition to air stripping, the treatment system will include carbon adsorption to ensure that cleanup levels are met. Air stripping is the primary treatment system and is expected to treat water to safe drinking water standards. However, in case there are circumstances when the air stripping system is not fully performing, it is important to have a back-up treatment system. Carbon adsorption is included as the back-up treatment system. The treated water will be used for irrigation.

In addition to extracting and treating groundwater at the source area, additional groundwater monitoring wells will be installed to define the downgradient extent of the plume and to assess whether additional extraction wells are needed. If monitoring shows that the extraction well in the source area is capturing the full extent of contamination, then no additional extraction wells are needed.

What is Monitored Natural Attenuation?

Monitored natural attenuation (MNA) includes a variety of physical, chemical or biological processes that, under favorable conditions, act without human intervention to reduce the concentration of contaminants in groundwater. Source control, a thorough characterization of the extent of the plume, and long-term performance monitoring are fundamental components of any MNA remedy. MNA will be used only when it will meet groundwater cleanup objectives within a time frame that is reasonable compared to pumping and treating the plume. Groundwater monitoring will continue for a specified period of time after groundwater has been cleaned up to drinking water standards (called Maximum Contaminant Levels or MCLs) to ensure that concentration levels are stable and remain below MCLs.

If the downgradient plume is not captured, but there is evidence that the plume is not moving and the contaminants are breaking down by natural processes (called natural attenuation) then no additional extraction wells are needed. However, if the plume is not captured and natural attenuation is not occurring, then additional extraction wells will be required.

Finally, land use restrictions would be put in place to prevent activities that would adversely impact the effectiveness of groundwater monitoring or extraction wells. Point-of-use treatment is also included in the unlikely event that any drinking water wells are impacted.

The cost for Basal Aquifer Alternative 2 is $9.9 million.

Estimated clean-up time is 3 to 5 years.

Basal Aquifer Alternative 3: Groundwater Extraction and Treatment for Both the Source Area and the Downgradient Plume.

This alternative includes all the activities listed in Alternative 2, but would apply the same extraction and treatment technology to the entire basal aquifer plume with no contingency for MNA. In addition to extracting and treating groundwater at the source area, additional groundwater monitoring wells will be installed to define the downgradient extent of the plume. Once the boundaries of the plume are defined, extraction wells will be installed to capture the entire downgradient extent of the plume. Some of the monitoring wells installed to define the plume will also be used for extraction depending on their location within the plume.

The cost for Basal Aquifer Alternative 3 is $17.9 million.

Estimated clean-up time is 3 to 5 years.

Analyzing the Options

As required by federal regulations, U.S. EPA uses nine criteria to analyze remedy options (see Figure 4). Seven of these are used to compare the technical aspects of various alternatives:

1) Overall protection of human health and the environment

2) Compliance with applicable or relevant and appropriate federal and state hazardous waste laws, called ARARs.

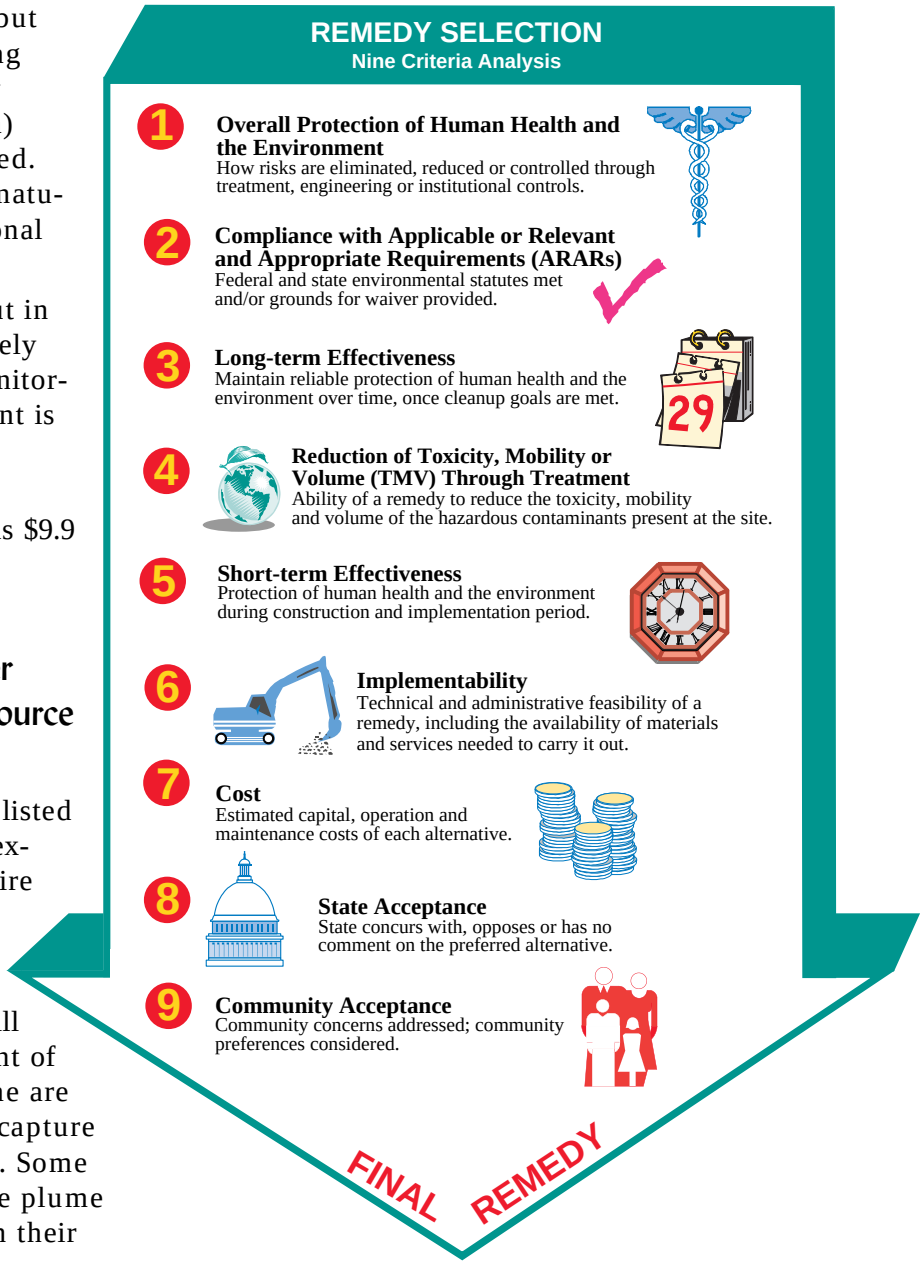

Figure 4: EPA's Selection Criteria

3) Long-term effectiveness (i.e., does the option continue to protect human health and the environment in the long-term?)

4) Reduction of toxicity, mobility and volume through treatment

5) Cost (including construction, operation and maintenance costs)

6) Short-term effectiveness (protection of human health and the environment during construction and time until clean-up objectives are achieved)

7) Implementability (i.e., can the remedy be built from an administrative and technical perspective?)

Alt	Remedy Option: Perched Aquifer	Overall Protection	ARARs	Long-term Reduction of Toxicity	Short-term Effectiveness	Implementability	Cost	EPA Evaluation
1	No Action	Not Protective	No	Poor	Poor	Good	No cost	Not Acceptable
2	Groundwater Extraction & Treatment, Capping	Protective	Yes	Moderate	Moderate	Moderate	$2.1 million	Acceptable but not preferred
3	Groundwater Extraction & Treatment, Capping, Soil Vapor Extraction	Protective	Yes	Good	Good	Good	$3.0 million	Preferred Remedy
	Remedy Option: Basal Aquifer							
1	No Action	Not Protective	No	Poor	Poor	Good	No cost	Not acceptable
2	Extraction & Treatment, Contingent Monitored Natural Attenuation	Protective	Yes	Good	Good	Good	$9.9 million	Preferred Remedy
3	Extraction & Treatment of Source and Down-gradient Areas	Protective	Yes	Good	Good	Good	$17.9 million	Acceptable, but not preferred due to high cost without significant decrease in cleanup time

Table 2: Evaluation of Remedy Alternatives for Del Monte Corporation Plantation Site

There are two additional criteria which must be considered when U.S. EPA makes a remedy decision: State acceptance of the remedy and community acceptance of the remedy. The State of Hawaii has given its acceptance of the proposed alternative and the community's acceptance will be determined at the end of the comment period.

Table 2 shows how the various alternatives compare to each other.

EPA's Preferred Alternatives

For the perched aquifer, EPA's preferred remedy is Alternative 3: Extraction and Treatment, Capping, and Soil Vapor Extraction. Alternative 2 would be effective at meeting EPA's goal of preventing perched aquifer contaminants from further contaminating the basal aquifer. However, by extracting contaminants from soil, Alternative 3's SVE system has the potential to clean up the perched aquifer more quickly than Alternative 2. The No Action Alternative did not meet the minimum requirements for an acceptable remedy because it was not protective of human health and the environment.

For the Basal Aquifer, EPA's preferred remedy is Alternative 2: Extraction and Treatment, with Contingent Monitored Natural Attenuation. It is believed that once the source area is captured, natural attenuation should effectively clean up the remainder of the plume in as little as three years. Although Alternative 3 is also effective, its greater cost and complexity, and the fact that it does not ensure that the plume will be cleaned up faster than Alternative 2, make it a less desirable remedy. However, if it is found that natural attenuation is not occurring, then Alternative 3 will become the preferred remedy.

For both preferred alternatives, EPA would require land-use controls to prevent access to contaminated soil and groundwater and point-of-use treatment as a contingency.

Opportunities for Community Involvement

EPA invites your participation in selecting the remedy for the Del Monte Corporation (Oahu Plantation) Site. There are a number of ways you can become involved. The public comment period runs from March 19, 2003 to April 18, 2003. EPA encourages the public to comment on all alternatives. A community meeting will be held on April 2, 2003, from 7-9 pm, at the Wahiawa Middle School Library, 275 Rose Street, Wahiawa. You may provide your comments in writing or verbally.

In addition, EPA welcomes written comments submitted directly to our office. Please send those comments to Janet Rosati (see address on back page). Written comments may also be faxed to Janet Rosati at 415-947-3526 or e-mailed to her at rosati.janet@epa.gov. All written comments sent by

e-mail must be dated no later than April 18, 2003 and all written comments sent by mail or fax must be postmarked by April 18, 2003.

After the comment period closes, EPA will prepare and issue a "Response to Comments" document, which gives EPA's answer to the questions and concerns raised by the commenters. EPA will also issue a document called the Record of Decision, or ROD, which details the selected remedy EPA will use at the Site. Copies of both the Response to Comments document and the Record of Decision will be placed in the Administrative Record at the Wahiawa Library.

To learn more about the Site, you will find an extensive amount of information at EPA's information repositories at the Wahiawa Library (please see address below) or the EPA Records Center, 95 Hawthorne, San Francisco. This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation, the Feasibility Study and other documents contained in the repositories.

Technical Assistance Grant Availability

EPA is able to award $50,000 for a Technical Assistance Grant to an eligible community group interested in learning about technical aspects of the cleanup process and future cleanup actions. The funds are available to pay for the services of an independent technical advisor and to share information with the interested community.

Information about the TAG program and an application packet can be obtained by contacting the EPA Region 9 office toll-free at (800) 231-3075.

FOR ADDITIONAL INFORMATION

The Remedial Investigation, Feasibility Study, Community Relations Plan and other site-related documents are available for public review at the the following two locations:

Superfund Records Center
U.S. EPA Region 9
95 Hawthorne Street
San Francisco, CA 94105
(415) 563-2000

Wahiawa Public Library
820 California Avenue
Wahiawa, HI 96786
(808) 622-6345

• Mailing List Coupon •

If you would like to be included on the mailing list for the Del Monte Superfund site, you may fill out the coupon below and send it to:

David Cooper, Community Involvement Specialist
U.S. Environmental Protection Agency Region 9
75 Hawthorne Street (SFD-3)
San Francisco, CA 94105

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NAME: _____

ADDRESS: _____

_____

PHONE: _____

PUBLIC MEETING • COMMENT PERIOD

• FOR MORE INFORMATION •

If you would like more information or have questions about activities at the Del Monte Corporation Plantation Superfund Site, please contact:

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Community Involvement Coordinator
U.S. EPA Region 9 (SFD-3)
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3237

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Remedial Project Manager
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75 Hawthorne Street
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